As plaster expands on setting, the compositions of the invention may conveniently be used for making accurate mouldings e.g. statuettes. Pleasing multicolour tarrazzo effects can be obtained by breaking up sheets of set material of different colours into pieces say ⅛th inch to ½ inch in size and mixing them with wet material of a different colour. Such a mixture when cast can be ground wet or dry to give the required effect.

Versitate-Veovo resins are useful in this invention. They can be used, for example, in a 15:85 ratio with polyvinylacetate to soften it and the resulting resin can be usefully employed in place of the styrene/acrylate copolymers of Examples 1, 2 and 3.

When used as a flooring composition, the material can contain for example an accelerator for a subsequent polyester layer e.g. an organic peroxide dissolved for example in dibutyl phthalate.

The preferred set compositions of the invention have a water absorption figure of 1 to 3% by weight over 48 hours.

The proportions of the essential ingredients in the preferred compositions are as follows (disregarding any filler present).

	Percent by weight
Polymer resin emulsion (40%–56% resin solids)	12.0 – 62.0
Temporary plasticizing and coalescent solvent	0 – 3
Calcium sulphate	35.0 – 80.0
Water	0 – 37.0
Anti-foaming agent	0 – 2
Urea and/or melamine formaldehyde resin	0 – 15

The Nopco anti-foaming agent is a blend of chemically modified naturally occurring oils and fats and the Bevaloid 581B anti-foaming agent (which can equally well be used in the compositions of the Examples) is a mixture of synthetic and natural esters, metallic soap and emulsifiers dispersed in a light hydrocarbon oil.

The resins used in the compositions of this invention should desirably be capable of forming a hard continuous resin film on removal of water. Polyvinyl acetate and polystyrene are too hard in themselves to form films and it is necessary either to blend or copolymerize them with other resins such as acrylates or to use plasticizing agents (including coalescing solvents) (see Example 4) in order to make them film-forming. The term "hard" when used herein in relation to resins is intended to mean a Rocker hardness of about 10% to about 45%. In the Rocker hardness test a pendulum swings over a plate coated with resin and the percentage figure is twice the number of oscillations which the pendulum effects before it is stopped by the drag of the resin (50 oscillations are obtained with a standard glass plate). On this scale the resin of Example 1 has a hardness of about 16%, that of Example 2 about 14%, that of Example 3 about 20%, that of Example 4 about 38%, that of Example 5 about 44%, and that of Examples 7 and 8 about 14%. Example 6 gives a rough film which is difficult to test. The figures are given for the resins without plasticizers.

It has been found that the flexural strength of sheet materials such as hardboard and plaster board can be dramatically increased by coating one or both faces with compositions according to the invention. For even greater flexural strength, reinforcing materials can, if desired, be incorporated in the composition either in membrane or in shredded form. Such reinforcing materials include glass fibre in tissue, matting or chopped strand form as well as nylon and other synthetic forms of netting, hession and cotton scrim. The membranes are embedded in the composition immediately after application and prior to setting whereas the materials in shredded form can be intermixed with the composition prior to application.

By incorporating the above types of reinforcing materials in either of the ways mentioned, the material itself can be cast in sheet or panel form to any desired thickness. Such set sheets or panels have remarkable flexural strength, durability, workability and fire-resistance.

EXAMPLE 15

A composition according to Example 9 was coated with a paint brush onto a piece of hardboard, a chopped fibre glass mat of about 1/32 inch thickness was applied to the wetted surface, and a further layer of composition applied with a paint brush. After the composition set, there was a marked increase in the flexural strength of the hardboard. It was found that, for added strength, successive layers could be applied without waiting for the previous layers to set.

EXAMPLE 16

A composition according to Example 9 is cast by placing a chopper fibre glass mat in a mould, wetting out the mat with the composition and finally pouring more of the composition over the mat to fill the mould. The product is then set. Again successive layers can be built up without setting the composition at each stage.

I claim:

1. A process for making a set composition which comprises providing a composition capable of flowing under its own weight to give a smooth flat surface when applied to a substantially horizontal substrate, said composition consisting essentially of a calcium sulphate alpha-hemihydrate plaster and an aqueous resin emulsion capable of forming a hard continuous resin film on removal of water, said resin being a polymer of an ethylenically unsaturated monomer and having a Rocker hardness of about 10% to about 45% and being in a stable emulsified finely divided form, the relative proportions of the plaster and the resin being such that the plaster takes up the major part of the water in the emulsion when it sets, the proportion of dry resin solids being from 10% to 35% by weight based on the weight of dry plaster solids and the amount of water present being from 15% to 35% by weight based on the weight of dry plaster solids, and allowing said composition to set over a period of time.

2. A process according to claim **1**, wherein the amount of water present is from 15% to 24% by weight based on the weight of dry plaster solids.

3. A process according to claim **1**, wherein the resin is selected from the group consisting of polymers of alkyl acrylates and methacrylates having 1 to 12 carbon atoms in the alkyl group and copolymers thereof with vinyl acetate or styrene or mixture thereof, polyvinyl acetate and polystyrene.

4. A process according to claim **1** wherein the resin emulsion has a resin particle size of 0.1 to 1.5 microns.

5. A process for making a set composition which comprises providing a self-levelling and self-smoothing fluid plaster composition capable of flowing under its own weight to give a smooth flat surface when applied